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(54) **Ink ribbon cassette which can be used in line type thermal transfer printer**

Tintenbandcassette für einen Thermotransferzeilendrucker

Cassette de ruban d'encre pour une Imprimante transfer thermique du type ligne par ligne

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an ink ribbon cassette and, in particular, to an ink ribbon cassette which can be suitably used in a line type thermal transfer printer.

2. Description of the Related Art

[0002] A conventional ink ribbon cassette 20 used in a line type thermal transfer printer will be described with reference to Figs. 10 and 11. On the right-hand side as seen in the drawing, there is formed a main body portion 24 which rotatably supports a supply core 22 around which an ink ribbon 21 is wound and a take-up core 23.

[0003] Further, as shown in Fig. 11, in the vicinity of the supply core 22 of the main body portion 24, there is formed a ribbon outlet 24a through which the ink ribbon 21 wound around the supply core 22 can be drawn out in the direction of the arrow B.

[0004] Further, a ribbon guide portion 25 extends to the left from the main body portion 24. This ribbon guide portion 25 has a ribbon turn-up portion 25a in the lower portion of the forward end portion thereof and, further, there are provided a flat first ribbon slide contact surface 25b extending upwardly substantially at right angles from the ribbon turn-up portion 25a, an inclined second ribbon slide contact surface 25c connected to the first ribbon slide contact surface 25b, and a horizontal third ribbon slide contact surface 25d connected to the second ribbon slide contact surface 25c, the ink ribbon 21 being capable of being drawn around the outer peripheral surfaces of the first, second and third slide contact surfaces 25b, 25c and 25d.

[0005] The ink ribbon 21, drawn out from the ribbon outlet 24a in the direction of the arrow B, is turned up upwardly substantially at right angles (in the direction of the arrow C) at the ribbon turn-up portion 25a, and can be drawn around along the first ribbon slide contact surface 25b.

[0006] Further, between the ink ribbon 21 drawn out from the ribbon outlet 24a in the direction of the arrow B and the upper ribbon guide portion 25, there is formed a head insertion portion 26 into which a line thermal head (not shown) on the printer side can be inserted.

[0007] In the ink ribbon cassette 20 described above, by rotating the take-up core 23 in the direction of the arrow A, the ink ribbon 21 wound around the supply core 22 is drawn out from the ribbon outlet 24a in the direction of the arrow B.

[0008] And, the ink ribbon 21 is turned up by substantially 90 degrees at the ribbon turn-up portion 25a to the first ribbon slide contact surface 25b, and, from the first ribbon slide contact surface 25b, drawn around the outer

peripheral surfaces of the second and third slide contact surfaces 25c and 25d in the direction of the arrow D to be taken up by the take-up core 23.

[0009] The operation of printing by a thermal transfer printer (not shown) by using this conventional ink ribbon cassette 20 will be described. When the ink ribbon cassette 20 is attached to a cassette attachment portion (not shown) on the printer side, a line thermal head (not shown) having a plurality of heat generating elements is positioned in the head insertion portion 26, and the rotation shaft of the take-up core 23 is engaged with a rotation shaft which is rotated by a motor (not shown) serving as a drive source.

[0010] Further, recording paper (not shown) is fed and positioned below the ink ribbon 21 drawn to a position below the head insertion portion 26.

[0011] Next, a platen roller (not shown) positioned below the line thermal head positioned in the head insertion portion 26 and the line thermal head are moved relative to each other to bring the platen roller and the line thermal head into press contact with each other through the intermediation of the ink ribbon 21 and the recording paper.

[0012] And, the recording paper is fed while selectively causing the heat generating elements of the line thermal head to generate heat, the take-up core 23 is rotated in the direction of the arrow A through the rotation of the motor serving as the drive source to take up the ink ribbon 21 on the take-up core 23, whereby ink of the ink ribbon 21 is transferred to the recording paper, making it possible to print a desired image on the recording paper.

[0013] An ink ribbon cassette of similar design as above is further known from WO-A-9 421 468.

[0014] In the conventional ink ribbon cassette 20 described above, the ink ribbon 21 positioned in the main body portion 24 and the ribbon guide portion 25 is exposed, so that when the operator handles the ink ribbon cassette 20, he or she may touch the ink ribbon 21 to cause it to wrinkle. When the ink ribbon 21 wrinkles, the printing quality deteriorates.

[0015] Further, at the ribbon turn-up portion 25a, the ink ribbon 21 is drawn to the first slide contact portion 25b, which is perpendicular to the ribbon turn-up portion 25a, so that the frictional resistance is maximum at the ribbon turn-up portion 25a and the first slide contact portion 25b, and the ribbon guide portion 25 is deflected to suffer deformation when the ribbon is taken up on the take-up core 23, with the result that biasing or the like occurs when running the ribbon.

[0016] Further, since the ink ribbon 21 offers large frictional resistance at the ribbon take-up portion 25a and the first ribbon slide contact surface 25a, the take-up torque when taking up the ink ribbon 21 on the take-up core 23 is large, and a large capacity is needed for the motor serving as the drive source, resulting in an increase in the power consumption of the printer.

SUMMARY OF THE INVENTION

[0017] According to the present invention there is provided an ink ribbon cassette according to Claim 1. In this cassette there is no fear of the ink ribbon being inadvertently touched while the ribbon cassette is being handled, and wrinkles or the like are not easily generated in the ink ribbon during handling.

[0018] The ribbon take-up portion is formed by a rotatable roller member, whereby the frictional resistance generated in the ink ribbon turned up at the ribbon turn-up portion.

[0019] The turn-up angle of the ink ribbon turned up at the ribbon turn-up portion is set at 10 to 80 degrees and the frictional resistance at the ribbon turn-up portion when taking up the ink ribbon is reduced through distribution, whereby the ribbon guide portion is not deflected when taking up the ink ribbon, thereby preventing troubles such as biasing of the ink ribbon.

[0020] Preferably, the roller member has a hand-drum-like configuration whose size is smaller near its central portion than its end portions, whereby an outward tension in the width direction is applied to the ink ribbon turned up at the roller member, whereby wrinkles or the like are prevented from being generated in the ink ribbon.

[0021] Advantageously, the turn-up angle of the ink ribbon is 60 degrees, whereby the frictional resistance of the ink ribbon turned up at the ribbon turn-up portion is further reduced.

[0022] Preferably, a rotatable guide roller is arranged at the portion of the ribbon outlet which comes into contact with the ink ribbon, whereby it is possible to reduce the take-up torque of the take-up core for drawing out the ink ribbon wound around the supply roller at the time of printing, with the result that it is possible to reduce the capacitance of the motor for rotating the take-up core, making it possible to reduce the consumption power of the printer.

[0023] Preferably, the diameter of the take-up core is smaller than the diameter of the take-up core, whereby it is possible to cope with a so-called fattening in which the outer diameter of the ink ribbon taken up on the take-up core increases through damage during printing.

[0024] Preferably, the supply core and the take-up core are supported so as to be rotatable between a pair of side walls formed in a direction perpendicular to the ribbon guide portion, whereby even when the supply core and the take-up core are long, it is possible to perform assembly while supporting the end portions of the supply core and the take-up core between the pair of side walls.

[0025] The main body portion may be provided with a holder member which has the ribbon guide portion and holds the supply core and the take-up core, and a case member which can hold the holder member so as to cover from outside the supply core and the take-up core with a first case and a second case, wherein the holder

member has a first side wall having a pair of circular bearing portions and a second side wall having a pair of semi-circular bearing portions, wherein the second case of the case member has a third side wall having a pair of semi-circular bearing portions, and wherein the other end portions of the supply core and the take-up core are rotatably supported by the semi-circular bearing portions of the second side wall and the third side wall, whereby even when the supply core and the take-up core are long, it is possible to mount the case member such that the supply core and the take-up core are covered with the end portions of the supply core and the take-up core being held, thereby achieving satisfactory assembly efficiency.

[0026] Preferably, the case member is formed of a resin material and wherein the first case and the second case are joined by a thin-walled hinge, the first case and the second case being rotatable through this hinge portion, whereby the first case and the second case are formed as an integral unit, thereby reducing the number of parts.

[0027] Preferably, the case member has an engagement portion which can be engaged and disengaged by rotating the first case and/or the second case, and wherein the holder member held between the first case and the second case can be attached and detached inside the case member through engagement and disengagement of the engagement portion, whereby it is possible to easily replace the supply core and the take-up core around which the ink ribbon is wound, and the case member and the holder member can be re-utilized.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028]

Fig. 1 is a sectional view of a main portion of a first embodiment of the present invention;

Fig. 2 is a top view of Fig. 1;

Fig. 3 is a left-hand side view of Fig. 1;

Figs. 4A through 4C are diagrams showing a holder member in the first embodiment of the present invention, of which

Fig. 4A is a left-hand side view of the same;

Fig. 4B is a bottom view of the same; and

Fig. 4C is a right-hand side view of the same;

Figs. 5A through 5C are diagrams showing a condition in which a first case and a second case of a case member of the first embodiment of the present invention are rotated by rotating a hinge portion, of which

Fig. 5A is a left-hand side view of the same;

Fig. 5B is a bottom view of the same; and

Fig. 5C is a right-hand side view of the same;

Fig. 6 is a diagram illustrating the assembly of a case member and a holder member according to the first embodiment of the present invention;

Figs. 7A through 7C are diagrams showing a holder

member according to a second embodiment of the present invention, of which

Fig. 7A is a left-hand side view of the same;

Fig. 7B is a bottom view of the same; and

Fig. 7C is a right-hand side view of the same;

Figs. 8A through 8C are diagrams showing a condition in which a first case and a second case of a case member of the first embodiment of the present invention are rotated by rotating a hinge portion, of which

Fig. 8A is a left-hand side view of the same;

Fig. 8B is a bottom view of the same; and

Fig. 8C is a right-hand side view of the same;

Fig. 9 is a diagram showing a turn-up roller according to an embodiment of the present invention;

Fig. 10 is a perspective view of a conventional ink ribbon; and

Fig. 11 is a sectional view of a main portion of the conventional ink ribbon.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0029] As shown in Fig. 1, the ink ribbon cassette 1 of the first embodiment of the present invention is provided with a main body portion 3 having a substantially elliptical hollow portion accommodating an ink ribbon 2 having on one side an ink surface 2a. This main body portion 3 accommodates a supply core 4 and a take-up core 5 around which the end portions of the ink ribbon 2 are wound.

[0030] The main body portion 3 has a pair of side walls 3a and upper and lower cases 3b to form a hollow interior. And, the supply core 4 and the take-up core 5 are rotatably held in the hollow portion of the main body portion 3.

[0031] Further, on the right-hand side of the supply core 4 in the main body portion 3, there is formed a slit-like ribbon outlet 3c through which the ink ribbon 2 wound around the supply core 4 can be drawn out to the exterior.

[0032] Further, the main body portion 3 has a ribbon guide portion 6 formed so as to extend to one side from this main body portion 3, and a holder member 7 which holds the supply core 4 and the take-up core 5 around which the ink ribbon 2 is wound.

[0033] This holder member 7 is formed of a resin material. As shown in Fig. 4, in the portion constituting the main body portion 3, a first side wall 11 and a second side wall 12, which are a pair of side walls, are formed so as to be opposed to each other in a direction perpendicular to the direction in which the ribbon runs.

[0034] The first side wall 11 has a pair of circular bearing portions 11a and 11b and is formed in a substantially elliptical configuration, and the second side wall 12 has a pair of semi-circular bearing portions 12a and 12b and is formed in a configuration such as can be obtained by cutting the first side wall in half.

[0035] Further, the ribbon guide portion 6 formed so as to extend to one side from the main body portion 3 has on its upper side a ribbon slide contact surface 6a which can be brought into slide contact with the ribbon, and, at the right-hand end portion, there is formed a ribbon turn-up portion 10 having a rotatable turn-up roller 10a. The ink ribbon 2, drawn out through the ribbon outlet 3c, is turned up at the turn-up roller 10a at a turn-up angle α , and drawn around to the ribbon slide contact surface 6a.

[0036] The turn-up angle α of the ink ribbon 2 is 10 to 80 degrees (The maximum angle is around 60 degrees), so that, when taking up the ink ribbon, it is possible to reduce the stress in the compressing direction applied to the ribbon guide portion 6, and the ribbon guide portion 6 is not deflected.

[0037] The turn-up roller 10a is formed as a cylinder and its end portions are rotatably supported by a pair of side walls 3d of the main body portion 3, so that the turn-up roller 10a rotates when taking up the ink ribbon 2 by the take-up core 5. Thus, it is possible to reduce the frictional resistance of the ink ribbon 2, which is drawn around the ribbon turn-up portion 7, and the ink ribbon 2 can be smoothly taken up on the take-up core 5.

[0038] Further, there is formed a gap 13 of a predetermined dimension between the ribbon turn-up portion 10 and the ribbon slide contact surface 6a, so that, between the ribbon turn-up portion 10 and the ribbon slide contact surface 6a, nothing comes into contact with the ink ribbon 2, thereby further reducing the frictional resistance when taking up the ink ribbon 2.

[0039] Further, at the portion of the ribbon outlet 3C which comes into contact with the ink ribbon, there is arranged a metal guide roller 3e which is rotatably held, whereby the draw-out load of the ink ribbon 2 drawn out from the main body portion 3 is reduced. Further, by forming the guide roller 3e of metal, the amount of static electricity generated in the ink ribbon can be reduced.

[0040] Further, the diameter of the take-up core 5 when no ink ribbon is wound around it is smaller than the diameter of the supply core 4 when no ink ribbon is wound around it. Due to this arrangement, if the ink ribbon 2 is thermally damaged during printing, it is possible to cope with a so-called fattening, in which the outer dimension of the take-up core 5 when the ink ribbon is taken up increases when the ink ribbon is taken up on the take-up core 5.

[0041] The supply core 4 and the take-up core 5 around which the ink ribbon 2 is wound can be supported by the holder member 7 by inserting one end portions into the circular bearing portions 11a and 11b of the first side wall 11 and positioning the other end portions in the semi-circular bearing portions 12a and 12b of the second side wall 12.

[0042] That is, in the ink ribbon cassette 1 of the present invention, the supply core 4 and the take-up core 5 are supported between the pair of first and second side walls 11 and 12 arranged in a direction perpen-

dicular to the ribbon guide portion 6 (ribbon running direction).

[0043] Further, arranged in the main body portion 3 is a case member 13 capable of holding the holder member 7 by holding the supply core 4 and the take-up core 5 in such a way as to cover them from outside with first and second cases 14 and 15.

[0044] This case member 13 can be formed of a resin material. In Fig. 5, the first case 14 is arranged on the left-hand side, and the second case 15 is arranged on the right-hand side. The first case 14 and the second case 15 are joined by a thin-walled hinge portion 13a, and the first and second cases 14 and 15 are rotatable through the intermediation of this hinge portion 13a.

[0045] Further, provided in the first case 14 is an engagement claw 14a which is an engagement portion capable of engaging and disengaging the first case 14 and the second case 15 when the first case 14 and the second case 15 are rotated through the intermediation of the hinge portion 13a.

[0046] Further, at the upper end of the second case 15 shown in Fig. 5B, there is formed a third side wall 15c having a pair of semi-circular bearing portions 15a and 15b, and a pair of engagement holes 15d into which the engagement claw 14a of the first case 14 is inserted for snapping engagement extend therethrough. At the right-hand end of the second side wall 15, there are formed a pair of triangular paper guides 16.

[0047] That is, formed in the case member 13 are an engagement claw 14a and an engagement hole 15d which are engagement portions that can be engaged and disengaged through by rotating the first case 14 and/or the second case 15 through the intermediation of the hinge portion 13a.

[0048] Further, when the second case 15 of the case member 13 is positioned on the pair of first and second side walls 11 and 12 of the holder member 15, the second side wall 12 and the third side wall 13c abut each other so as to be opposed to each other, and the semi-circular bearing portions 12a, 15a and 12b, 15b are opposed to each other, forming a circular bearing portion.

[0049] Further, as shown in Fig. 1, when the supply core 4 and the take-up core 5 held by the holder member 7 are held in such a way as to cover them with the first case 14 and the second case 15, a slit-like ribbon outlet 3c through which the ink ribbon 2 wound around the supply core 4 can be drawn out.

[0050] Further, on the upper side of the ribbon guide portion 6, and between the ribbon slide contact surface 6a and the first case 14, there is formed a slit-like ribbon inlet 3f, and the ink ribbon 2 wound around the supply core 4 and drawn out from the ribbon outlet 3c can be drawn into the main body portion 3 again through the ribbon inlet 3f and taken up by the take-up core 5 from the condition in which it is turned up at the ribbon turn-up portion 10.

[0051] When assembling the ink ribbon cassette 1, constructed as described above, the holder member 7

is held in a position as shown in Fig. 4C in which the first side wall 11 and the second side wall 12 are directed upward, and one end portion of the supply core 4 is inserted into the circular bearing portion 11b of the first side wall 11, and the other end portion of the supply core 4 is positioned in the semi-circular bearing portion 12b of the second side wall 12.

[0052] In this condition, the take-up core 5 around which the ink ribbon 2 is wound is passed over the ribbon guide portion 6 shown in Fig. 2C and moved to the ribbon turn-up portion 10 side, and the lower portion of the ribbon guide portion 6 is turned to the left from the ribbon turn-up portion 10.

[0053] Then, the ink ribbon 2 is drawn out from the supply core 4, and turned up downwardly at the ribbon turn-up portion 10 and guided on the ribbon slide contact surface 6a of the ribbon guide portion 6. In this condition, the take-up core 5 is moved to the first side wall 11 and the second side wall 12, and one end portion of the take-up core 5 is inserted into the circular bearing portion 11a of the first side wall 11, and the other end portion of the take-up core 5 is positioned in the semi-circular bearing portion 12a of the second side wall 12.

[0054] Then, one end portions of the supply core 4 and the take-up core 5 are supported by the circular bearing portions 11a and 11b, and the lower halves of the other end portions thereof are supported by the semi-circular bearing portions 12a and 12b, and the ink ribbon 2 is drawn over the ribbon slide contact surface 6a from the supply core 4 by way of the ribbon turn-up portion 10, and can be taken up by the take-up core 5.

[0055] Next, when, as shown in Fig. 6, the second case 15 of the case member 13 is placed in such a way as to cover the upper portions of the supply core 4 and the take-up core 5 the end portions of which are held by the bearing portions 11a, 11b, 12a and 12b of the holder member 7, the semi-circular bearing portions 15a and 15b of the third side wall 15c are placed over the supply core 4 and the take-up core 5 the upper halves of which are exposed through the semi-circular bearing portions 13a and 13b of the second side wall 12, and the entire outer peripheral portion of the other end portions of the supply core 4 and the take-up core 5 are held by the bearing portions 12a, 12b, 15a and 15b.

[0056] When, in this condition, the first case 14 shown in Fig. 4 is rotated in the direction of the arrow H, the engagement claw 14 which is an engagement portion is snap-engaged with the engagement hole 15d which is the engagement portion of the second case 15, and the supply core 4 and the take-up core 5 are held in such a way as to be covered from outside with the first and second cases 14 and 15, whereby the ink ribbon cassette 1 as shown in Fig. 1 is assembled.

[0057] Between the ink ribbon 2 drawn out from the ribbon outlet 3c and the ribbon guide portion 6, there is formed a head insertion portion 17 into which a line thermal head (not shown) supported in a cantilever-like fashion on the printer (not shown) side can be inserted.

[0058] The ink ribbon 2 of the ink ribbon cassette 1 of the present invention, described above, is temporarily drawn out to the exterior through the ribbon outlet 3c formed in the main body portion 3 through the rotation of the core 5 in the direction of the arrow E, and drawn around below the head insertion portion 17 in the direction of the arrow G. And, from the condition in which it is turned up at a turn-up angle of α at the turn-up roller 8 which is the ribbon turn-up portion 7, the ribbon runs on the ribbon slide contact surface 6a of the ribbon guide portion 6, and is drawn into the main body portion 3 again through the ribbon inlet 3f, and can be taken up by the take-up core 5.

[0059] Further, in the case member 13, by rotating the first case 14 and/or the second case 15, the engagement portion consisting of the engagement claw 14a and the engagement hole 13d can be engaged and disengaged, and the holder member 7 held between the first and second cases 14 and 15 is detachable with respect to the case member 13 through engagement and disengagement of the engagement portion.

[0060] The printing operation by a thermal transfer printer using the ink ribbon cassette 1 of the first embodiment of the present invention, described above, will be illustrated. First, the ink ribbon 1 is attached to a cassette attachment portion (not shown) on the printer side.

[0061] Then, the line thermal head (not shown) on the printer side is inserted into the head insertion portion 17 and positioned therein.

[0062] At this time, below the line thermal head, a rotatable platen roller (not shown) arranged on the printer side is positioned.

[0063] And, the ink ribbon 2 is positioned between the line thermal head and the platen roller, and, below this ink ribbon 2, recording paper (not shown) that has been fed is positioned.

[0064] Next, the platen roller is moved upwardly or the line thermal head is moved downwardly to thereby bring the line thermal head and the platen roller into press contact with each other through the intermediation of the recording paper and the ink ribbon 2, and a plurality of heat generating elements (not shown) formed in the line thermal head are selectively caused to generate heat on the basis of printing information.

[0065] And, while feeding the recording paper, the take-up core 5 is rotated in the direction of the arrow 5 to take up the ribbon 2 in the direction of the arrow F. Then, the turn-up roller 10a of the turn-up portion 10 rotates, and the recording paper and the ink ribbon 2 held between the line thermal head and the platen roller are fed to the downstream side in the direction of the arrow G.

[0066] Then, the ink of the ink ribbon 2 is transferred to the recording paper, whereby a desired image is printed on the recording paper.

[0067] After the printing, the ink ribbon 2, the ink of which has been transferred to the recording paper, runs on the ribbon slide contact surface 6a of the ribbon guide

portion 6 from the condition in which it is turned up at the rotatable turn-up roller 10a, and is drawn into the main body portion 3 again and can be taken up by the take-up core 5.

[0068] Thus, the ink ribbon 2 can be taken up by the low-torque take-up core 5, and no excessive tensile force is applied to the ink ribbon 2 when it is taken up, so that the ribbon guide portion 6 is not deflected, and there is no biasing of the ink ribbon 2 and no wrinkles or the like are generated therein.

[0069] While in the first embodiment of the present invention described above the ribbon is turned up at the ribbon turn-up portion 10, with the ink ribbon 2 being turned up at a turn-up angle of 60 degrees, it is possible to take up the ink ribbon 2 turned up at the ribbon turn-up portion 10 with a low torque as long as the turn-up angle is in the range of 10 to 80 degrees.

[0070] While in the first embodiment of the present invention described above the turn-up roller 10a is formed as a cylinder, it is also possible, as shown in Fig. 9, for the turn-up roller 10a to be formed in a hand-drum-like configuration in which the outer diameter J of the portions where the end portions with respect to the width direction of the ink ribbon 2 are positioned is larger than the outer diameter H of the portion where the portion of the ink ribbon 2 near its center is positioned. In this turn-up roller 10a, the outer diameter J of the end portions is larger than the outer diameter H of the portion near the center by approximately 0.1 mm.

[0071] When the ink ribbon 2 is taken up on the take-up core 5 by using this hand-drum-like turn-up roller 10a, the end portions of the ink ribbon 2 with respect to its width direction positioned on the portions having the outer diameter J are pulled outwardly in the directions of the arrows K.

[0072] Thus, outward tensile forces in the directions of the arrows K are applied to the ink ribbon 2, and no wrinkles are generated in the ink ribbon 2 being taken up, whereby it is possible to achieve an improvement in printing quality.

[0073] A second embodiment of the present invention will be described with reference to Figs. 7 and 8. First, as shown in Fig. 7, in the holder member 27 constituting a part of the main body portion 3, there are formed a first side wall 31 having a pair of semi-circular bearing portions 31a and 31b, and a second side wall 32 having a pair of semi-circular bearing portions 32a and 32b, and in the ribbon guide portion 33, there are formed a ribbon slide contact surface 33a and a ribbon turn-up portion 34 having a turn-up roller 34a.

[0074] Further, as shown in Fig. 8, in a case member 35 constituting a part of the main body portion 3, a first case 36 and a second case 37 are joined by a thin-walled hinge portion 35a to form an integral unit. In the second case 37, there is formed, in the portion opposite to the first side wall 31 of the holder member 27, a third side wall 37c having a pair of semi-circular bearing portions 37a and 37b, and, in the portion opposite to the

second side wall 32 of the holder member 27, there is formed a fourth side wall 38 having a pair of semi-circular bearing portions 38a and 38b. That is, the bearing portions of the side walls 31, 32, 37 and 38 are all formed in a semi-circular configuration.

[0075] In this second embodiment, one end portions of the supply core 4 and the take-up core 5 are supported by the bearing portions 31a, 31b, 37a and 37b of the first side wall 31 and the third side wall 37c, and the other end portions of the supply core 4 and the take-up core 5 are supported by the bearing portions 32a, 32b, 38a and 38b of the second side wall 32 and the fourth side wall 38.

[0076] In this second embodiment of the present invention, the supply core 4 and the take-up core 5 are held in such a way as to be covered with the first and second cases 36 and 37, with the supply core 4 and the take-up core 5 being placed in the semi-circular bearing portions 31a, 31b, 32a and 32b of the holder member 27, so that there is no need to perform the operation of inserting one end portions of the supply core 4 and the take-up core 5 into the circular bearing portions 8a and 8b as in the first embodiment, whereby a further improvement is achieved in terms of assembly performance as compared with the first embodiment.

[0077] As described above, the ink ribbon of the ink ribbon cassette of the present invention is temporarily drawn out to the exterior from the ribbon outlet formed in the main body portion, and, from the condition in which it is turned up at the ribbon turn-up portion, it runs on the ribbon slide contact surface of the ribbon guide portion, and is again drawn into the main body portion to be taken up by the take-up core, so that the ink ribbon is accommodated in the case of the main body portion, whereby there is no fear of the ink ribbon being inadvertently touched during the handling of the ink ribbon cassette. Thus, it is possible to provide an ink ribbon cassette in which no wrinkles are generated in the ink ribbon during handling.

[0078] Further, since the turn-up angle of the ink ribbon turned up at the ribbon turn-up portion is 10 to 80 degrees, it is possible to reduce the frictional resistance at the ribbon turn-up portion when taking up the ink ribbon through distribution.

[0079] Thus, when taking up the ribbon, the ribbon guide portion is not deflected, whereby it is possible to prevent biasing of the ink ribbon or the like.

[0080] Further, the ribbon turn-up portion has a rotatable turn-up roller, and the ink ribbon is turned up by this turn-up roller, so that it is possible to reduce the frictional resistance of the ink ribbon when it is turn up at the ribbon turn-up portion.

[0081] Thus, it is possible to reduce the capacitance of the motor for rotating the take-up core, making it possible to provide an ink ribbon cassette capable of reducing the power consumption of the printer.

[0082] Further, the turn-up roller is formed in a hand-drum-like configuration in which the outer diameter of

the portions where the end portions with respect to the width direction of the ink ribbon are positioned is larger than the outer diameter of the portion where the portion of the ink ribbon near the center is positioned, so that an outward tensile force is applied to the end portions with respect to the width direction of the ink ribbon turned up at the turn-up roller, and wrinkles or the like are not generated in the ink ribbon. Thus, it is possible to achieve an improvement in printing quality.

[0083] Further, the ink ribbon cassette of the present invention is provided with a main body portion accommodating the supply core and the take-up core, and a ribbon guide portion extending to one side from this main body portion, and the supply core and the take-up core are rotatably supported between a pair of side walls formed in a direction perpendicular to the ribbon guide portion, so that even if the supply core and the take-up core are long, it is possible to perform assembly while supporting the end portions of the supply core and the take-up core between the pair of walls, whereby it is possible to provide an ink ribbon cassette providing satisfactory assembly performance.

[0084] Further, one end portions of the supply core and the take-up core are supported by circular bearing portions of the first side wall, and the other end portions of the supply core and the take-up core are supported by semi-circular bearing portions of the second and third side walls, so that, even if the supply core and the take-up core are long, it is possible to mount the case member so as to cover the supply core and the take-up core, with the end portions of the supply core and take-up core being supported by the bearing portions of the first and second side walls of the holder member, whereby it is possible to provide an ink ribbon cassette having satisfactory assembly efficiency.

[0085] Further, by making the bearing portion of the first side wall circular, it is possible to form the bearing portion with high accuracy, and one end portions of the supply core and the take-up core can be supported by the circular bearing portion without any play, making it possible to take up the ink ribbon without involving any biasing or the like.

[0086] Further, one end portions of the supply core and the take-up core are supported by the semi-circular bearing portions of the first and third side walls, and the other end portions of the supply core and the take-up core are supported by the semi-circular bearing portions of the second and fourth side walls, so that the supply core and the take-up core can be temporarily held by the holder member solely by placing the end portions of the supply core and the take-up core from above on the semi-circular bearing portions of the first and second side walls of the holder member, making it possible to provide an ink ribbon cassette which can be easily assembled.

[0087] Further, the case member is formed of a resin material, and the first and second cases are joined by a thin-walled hinge portion, the first and second cases be-

ing rotatable through this hinge portion, so that the first and second cases are combined by the hinge portion to form the case member as an integral unit, thereby reducing the number of parts.

[0088] Further, the case member has an engagement portion which can be engaged and disengaged by rotating the first case and/or the second case, and the holder member held between the first and second cases can be attached and detached through engagement and disengagement of the engagement portion, so that it is possible to attach and detach the holder member to and from the case member, and the supply core and the take-up core around which the ink ribbon, which is expendable, is wound, can be easily replaced, the case member and the holder member being capable of reutilized. Thus, it is possible to provide an ink ribbon cassette which is friendly to the environment.

Claims

1. An ink ribbon cassette (1) comprising:

a main body portion (3) accommodating an ink ribbon (2); a supply core (4) and a take-up core (5) which are accommodated in the main body portion (3) so as to be adjacent to each other and around which the end portions of the ink ribbon (2) are wound;

a ribbon guide portion (6) extending to one side from the main body portion (3) and having on one side a ribbon slide contact surface (6a); and **characterised by** a ribbon turn-up portion (10) formed of a rotatable roller (10a) at the forward end of the ribbon guide portion (6),

wherein the ink ribbon (2) is temporarily drawn out to the exterior from a ribbon outlet (3c) formed in the main body portion (3), and runs on the ribbon slide contact surface (6a) of the ribbon guide portion (6) after being turned at the ribbon turn-up portion (10) through a turn-up angle of between 10 to 80 degrees, and is drawn into the main body portion (3) through an ink ribbon inlet (3f) formed in the main body portion (3) to be taken up by the take-up core (5).

2. An ink ribbon cassette according to Claim 1, wherein the turn-up angle of the ink ribbon is 60 degrees.

3. An ink ribbon cassette according to Claim 1 or 2, wherein the guide roller is formed of metal.

4. An ink ribbon cassette according to Claim 1, 2 or 3, wherein the roller member has a hand-drum-like configuration in which the outer dimension of the portion thereof near the central portion is smaller

than the outer dimension of the end portions thereof.

5. An ink ribbon cassette according to any Claim 1 to 4, wherein a rotatable guide roller is arranged in the portion of the ribbon outlet with which the ink ribbon comes into contact.

6. An ink ribbon cassette according to any Claims 1 to 5, wherein there is formed between the ink ribbon drawn out between the ribbon outlet and the turn-up portion and the ribbon guide portion a gap into which a thermal head of the printer is to be inserted when the ink ribbon cassette is attached to the printer.

7. An ink ribbon cassette according to any preceding claim, wherein the diameter of the take-up core is smaller than the diameter of the supply core.

8. An ink ribbon cassette according to any preceding claim, wherein the supply core and take-up core are rotatably supported between a pair of side walls formed in a direction perpendicular to the ribbon guide portion.

9. An ink ribbon cassette according to any preceding claim wherein the main body portion comprises:

a holder member having the ribbon guide portion and holding the supply core and the take-up core; and a case member capable of holding the holder member by holding a first case and a second case in such a way as to cover from outside the supply core and the take-up core,

wherein formed on the holder member are the first side wall having a pair of circular bearing portions and a second side wall having a pair of semi-circular bearing portions,

wherein the second case of the case member has in the portion thereof opposed to the second side wall a third side wall having a pair of semi-circular bearing portions,

wherein one end portions of the supply core and the take-up core are rotatably supported by the circular bearing portions of the first side wall of the holder member, and

wherein the other end portions of the supply core and the take-up core are rotatably supported by the semi-circular bearing portions of the second side wall of the holder member and the third side wall of the second case.

10. An ink ribbon cassette according to Claim 9, wherein the case member is formed of a resin material and the first case and the second case are joined by

a thin-walled hinge, the first case and the second case being rotatable through this hinge portion.

11. An ink ribbon cassette according to Claim 10, wherein the case member has an engagement portion which can be engaged and disengaged by rotating the first case and/or the second case, and wherein the holder member held between the first case and the second case can be attached and detached in the case member by performing engagement and disengagement of the engagement portion.

12. An ink ribbon cassette according to Claim 1, wherein a running path for an ink ribbon which is once drawn out of the ribbon outlet formed at the main body and runs up to a point turned up by the ribbon turn-up portion and a running path for an ink ribbon running on the ribbon slide contact surface at the ribbon guide portion are approximately parallel to each other and their running directions are formed to be opposite to each other.

13. An ink ribbon cassette according to Claim 1, wherein the main body portion comprises:

a holder member having the ribbon guide portion and holding the supply core and the take-up core; and

a case member capable of holding the holder member by holding a first case and a second case in such a way as to cover from outside the supply core and the take-up core,

wherein formed on the holder member are a first side wall having a pair of circular bearing portions and a second side wall having a pair of semi-circular bearing portions,

wherein the second case of the case member has in the portion thereof opposed to the second side wall a third side wall having a pair of semi-circular bearing portions, and has in the portion opposed to the second side wall a fourth side wall having a pair of semi-circular bearing portions,

wherein one end portions of the supply core and the take-up core are rotatably supported by the bearing portions of the first side wall and the third side wall, and

wherein the other end portions of the supply core and the take-up core are rotatably supported by the bearing portions of the second side wall and the fourth side wall.

14. An ink ribbon cassette according to Claim 13, wherein the case member is formed of a resin material and the first case and the second case are joined by a thin-walled hinge, the first case and the second case being rotatable through this hinge por-

tion.

15. An ink ribbon cassette according to Claim 14, wherein the case member has an engagement portion which can be engaged and disengaged by rotating the first case and/or the second case, and wherein the holder member held between the first case and the second case can be attached and detached in the case member by performing engagement and disengagement of the engagement portion.

Patentansprüche

1. Farbbandkassette (1), die Folgendes aufweist:

einen Hauptkörperbereich (3), in dem ein Farbband (2) aufgenommen ist;
einen Zufuhrkern (4) und einen Aufnahmekern (5), die in dem Hauptkörperbereich (3) einander benachbart aufgenommen sind und um die herum die Endbereiche des Farbbandes (2) gewickelt sind;
einen Farbbandführungsbereich (6), der sich von dem Hauptkörperbereich (3) zur einen Seite erstreckt und der an einer Seite eine Farbband-Gleitberührungsfläche (6a) aufweist;

gekennzeichnet durch

einen Farbband-Umlenkbereich (10), der aus einer drehbaren Rolle (10a) an dem vorderen Ende des Farbbandführungsbereichs (6) gebildet ist, wobei das Farbband (2) zeitweise aus einem in dem Hauptkörperbereich (3) ausgebildeten Farbbandauslass (3c) nach außen herausgezogen wird, dann nach dem Umlenken an dem Farbband-Umlenkbereich (10) um einen Umlenkwinkel von ca. 10 bis 80 Grad an der Farbband-Gleitberührungsfläche (6a) entlang läuft und sodann durch einen in dem Hauptkörperbereich (3) ausgebildeten Farbbandeinlass (3f) in den Hauptkörperbereich (3) gezogen wird, um auf dem Aufnahmekern (5) aufgenommen zu werden.

2. Farbbandkassette nach Anspruch 1, wobei der Umlenkwinkel des Farbbandes 60 Grad beträgt.
3. Farbbandkassette nach Anspruch 1 oder 2, wobei die Führungsrolle aus Metall gebildet ist.
4. Farbbandkassette nach Anspruch 1, 2 oder 3, wobei das Rollenelement eine handtrommelartige Konfiguration aufweist, wobei die Außenabmessung des Bereichs desselben in der Nähe des zentralen Bereichs kleiner ist als die Außenabmessung seiner Endbereiche.

5. Farbbandkassette nach einem der Ansprüche 1 bis 4,
wobei eine drehbare Führungsrolle in demjenigen Bereich des Farbbandauslasses angeordnet ist, mit dem das Farbband in Berührung gelangt. 5
6. Farbbandkassette nach einem der Ansprüche 1 bis 5,
wobei zwischen dem Farbband, das zwischen dem Farbbandauslass und dem Umlenkbereich herausgezogen ist, und dem Farbbandführungsbereich ein Spalt gebildet ist, in den ein Thermokopf eines Druckers einzuführen ist, wenn die Farbbandkassette an dem Drucker angebracht ist. 10
7. Farbbandkassette nach einem der vorausgehenden Ansprüche,
wobei der Durchmesser des Aufnahmekerns kleiner ist als der Durchmesser des Zufuhrkerns. 15
8. Farbbandkassette nach einem der vorausgehenden Ansprüche,
wobei der Zufuhrkern und der Aufnahmekern zwischen einem Paar von Seitenwänden, die in einer zu dem Farbbandführungsbereich rechtwinkligen Richtung ausgebildet sind, drehbar gehalten sind. 20
9. Farbbandkassette nach einem der vorausgehenden Ansprüche,
wobei der Hauptkörperbereich Folgendes aufweist: 25
- ein Halteelement, das den Farbbandführungsbereich aufweist und den Zufuhrkern sowie den Aufnahmekern hält;
ein Gehäuseelement, das zum Halten des Halteelements in der Lage ist, indem ein erstes Gehäuseeteil und ein zweites Gehäuseeteil derart gehalten sind, dass diese den Zufuhrkern und den Aufnahmekern von außen bedecken, 30
- wobei an dem Halteelement eine erste Seitenwand, die ein Paar kreisförmiger Lagerbereiche aufweist, und eine zweite Seitenwand, die ein Paar halbkreisförmiger Lagerbereiche aufweist, gebildet sind, wobei das zweite Gehäuseeteil des Gehäuseelements in seinem der zweiten Seitenwand gegenüberliegenden Bereich eine dritte Seitenwand mit einem Paar halbkreisförmiger Lagerbereiche aufweist, 35
- wobei die einen Endbereiche des Zufuhrkerns und des Aufnahmekerns durch die kreisförmigen Lagerbereiche der ersten Seitenwand des Halteelements drehbar gelagert sind, und 40
- wobei die anderen Endbereiche des Zufuhrkerns und des Aufnahmekerns durch die halbkreisförmigen Lagerbereiche der zweiten Seitenwand des Halteelements und die dritte Seitenwand des zweiten Gehäuseteils drehbar gelagert sind. 45
10. Farbbandkassette nach Anspruch 9,
wobei das Gehäuseelement aus einem Harzmaterial gebildet ist und das erste Gehäuseeteil sowie das zweite Gehäuseeteil durch ein dünnwandiges Gelenk verbunden sind, wobei das erste Gehäuseeteil und das zweite Gehäuseeteil um diesen Gelenkbereich schwenkbar sind. 50
11. Farbbandkassette nach Anspruch 10,
wobei das Gehäuseelement einen Eingriffsbereich aufweist, der durch Verschwenken des ersten Gehäuseteils und/oder des zweiten Gehäuseteils in Eingriff gebracht und außer Eingriff gebracht werden kann, und wobei das zwischen dem ersten Gehäuseeteil und dem zweiten Gehäuseeteil gehaltene Halteelement durch in Eingriff Bringen und Lösen des Eingriffs des Eingriffsbereichs in dem Gehäuseelement angebracht und von diesem gelöst werden kann. 55
12. Farbbandkassette nach Anspruch 1,
wobei eine Laufbahn für Farbband, das einmal aus dem an dem Hauptkörper gebildeten Farbbandauslass herausgezogen ist und bis zu einem von dem Farbband-Umlenkbereich umgelenkten Punkt läuft, sowie eine Laufbahn für Farbband, das an der Farbband-Gleitberührungsfläche an dem Farbbandführungsbereich läuft, in etwa zueinander parallel sind und ihre Laufrichtungen einander entgegengesetzt ausgebildet sind. 60
13. Farbbandkassette nach Anspruch 1,
wobei der Hauptkörperbereich Folgendes aufweist:
- ein Halteelement, das den Farbbandführungsbereich aufweist und den Zufuhrkern sowie den Aufnahmekern hält; und
ein Gehäuseelement, das zum Halten des Halteelements in der Lage ist, indem ein erstes Gehäuseeteil und ein zweites Gehäuseeteil derart gehalten sind, dass diese den Zufuhrkern und den Aufnahmekern von außen bedecken, 65
- wobei an dem Halteelement eine erste Seitenwand, die ein Paar kreisförmiger Lagerbereiche aufweist, und eine zweite Seitenwand, die ein Paar halbkreisförmiger Lagerbereiche aufweist, gebildet sind, wobei das zweite Gehäuseeteil des Gehäuseelements in seinem der zweiten Seitenwand gegenüberliegenden Bereich eine dritte Seitenwand mit einem Paar halbkreisförmiger Lagerbereiche aufweist und in dem der zweiten Seitenwand gegenüberliegenden Bereich eine vierte Seitenwand mit einem Paar halbkreisförmiger Lagerbereiche aufweist, 70
- wobei die einen Endbereiche des Zufuhrkerns und des Aufnahmekerns durch die Lagerbereiche der ersten Seitenwand und der dritten Seitenwand

drehbar gelagert sind, und wobei die anderen Endbereiche des Zufuhrkerns und des Aufnahmekerns durch die Lagerbereiche der zweiten Seitenwand und der vierten Seitenwand drehbar gelagert sind.

14. Farbbandkassette nach Anspruch 13, wobei das Gehäuseelement aus einem Harzmaterial gebildet ist und das erste Gehäuseteil sowie das zweite Gehäuseteil durch ein dünnwandiges Gelenk verbunden sind, wobei das erste Gehäuseteil und das zweite Gehäuseteil um diesen Gelenkbereich schwenkbar sind.

15. Farbbandkassette nach Anspruch 14, wobei das Gehäuseelement einen Eingriffsbereich aufweist, der durch Verschwenken des ersten Gehäuseteils und/oder des zweiten Gehäuseteils in Eingriff gebracht und außer Eingriff gebracht werden kann, und wobei das zwischen dem ersten Gehäuseteil und dem zweiten Gehäuseteil gehaltene Halteelement durch in Eingriff Bringen und Lösen des Eingriffs des Eingriffsbereichs in dem Gehäuseelement angebracht und von diesem gelöst werden kann.

Revendications

1. Une cassette (1) de ruban encreur comprenant:

un portion formant le corps (3) pour loger un ruban encreur (2); un noyau d'alimentation (4) et un noyau d'enroulement (5) qui sont logés dans la partie principale du corps (3) de façon à être adjacents l'un à l'autre et autour desquels seront enroulées les extrémités du ruban encreur (92);

une portion servant de guide (6) du ruban et s'étendant vers un côté en partant de la portion principale (3) du corps et ayant sur un côté une surface de contact (6a) pour une glissière de ruban; et caractérisée par

un portion (10) pour le repli du ruban formée d'un rouleau (10a) pouvant tourner à l'extrémité située avant de la portion de guidage (6) du ruban,

dans laquelle le ruban encreur (2) est temporairement étiré vers l'extérieur d'une sortie (3c) de ruban formée dans le corps principal (3) et passe sur la surface de contact (6a) de la glissière à ruban de la portion de guidage (6) du ruban après avoir été replié à la partie de repliement (10) du ruban en un angle de repliement entre 10 et 80 degrés, et qui est tiré dans la portion principale (3) de corps par une entrée (3f) pour ruban encreur, formée dans la portion principale (3) du corps, pour être capté par

le noyau d'enroulement (5).

2. Une cassette de ruban encreur selon la revendication 1, dans laquelle l'angle de repli du ruban encreur est de 60 degrés.

3. Une cassette de ruban encreur selon la revendication 1 ou 2, dans laquelle le rouleau de guidage est fait de métal.

4. Une cassette de ruban encreur selon la revendication 1, 2 ou 3, dans laquelle la pièce formant rouleau a une configuration en tambour, dans lequel la dimension extérieure de sa partie proche de la portion centrale est inférieure à la dimension extérieure des portions de bout.

5. Une cassette de ruban encreur selon une des revendications de 1 à 4, dans laquelle un rouleau de guidage pouvant tourner est disposé dans la portion de sortie du ruban avec laquelle le ruban encreur vient en contact.

6. Une cassette de ruban encreur selon une des revendications de 1 à 5, dans laquelle un écartement est formé entre le ruban encreur étiré entre la sortie du ruban et la portion repliée et la portion de guidage du ruban; cet écartement reçoit une tête thermique d'imprimante quand la cassette du ruban encreur est placée dans l'imprimante.

7. Une cassette de ruban encreur selon l'une quelconque des revendications précédentes, dans laquelle le diamètre du noyau d'enroulement est moindre que le diamètre du noyau d'alimentation.

8. Une cassette de ruban encreur selon l'une quelconque des revendications précédentes, dans laquelle le noyau d'alimentation et le noyau d'enroulement sont soutenus, de façon à pouvoir tourner, entre une paire de parois latérales formées en une direction perpendiculaire à la portion de guidage du ruban.

9. Une cassette de ruban encreur selon l'une quelconque des revendications précédentes, dans laquelle la portion de corps principal comprend:

une pièce de support portant la portion de guidage de ruban et maintenant le noyau d'alimentation et le noyau d'enroulement; et une pièce boîtier capable de maintenir la pièce de support en soutenant un premier boîtier et un deuxième boîtier de façon à couvrir de l'extérieur le noyau d'alimentation et le noyau d'enroulement;

dans laquelle, formée sur la pièce de soutien,

- il y a une première paroi latérale ayant une paire de portions de soutien circulaires et une deuxième paroi latérale ayant un paire de portions de soutien semi-circulaires,
- dans lequel le deuxième boîtier de la pièce 5 boîtier présente, dans sa portion opposée à la deuxième paroi latérale, une troisième paroi latérale ayant une paire de portions de soutien semi-circulaires;
- dans laquelle les portions d'extrémité du 10 noyau d'alimentation et du noyau d'enroulement sont supportées, de façon à pouvoir rouler, par les portions de soutien circulaires de la première paroi latérale de la pièce de support, et
- dans laquelle les autres portions d'extrémité 15 du noyau d'alimentation et du noyau d'enroulement sont soutenues, de façon à pouvoir rouler, par les portions de soutien semi-circulaires de la deuxième paroi latérale de la pièce de support du deuxième boîtier. 20
10. Une cassette de ruban encreur selon la revendication 9, dans laquelle la pièce formant boîtier est faite d'une matière en résine et le premier boîtier et le 25 deuxième boîtier sont réunis par une charnière à paroi mince, le premier boîtier et le deuxième boîtier pouvant tourner au moyen de cette portion charnière.
11. Une cassette de ruban encreur selon la revendication 10, dans laquelle la pièce boîtier a une portion engageable, qui peut s'engager et se désengager en faisant tourner le premier boîtier et/ou le deuxième boîtier, et dans laquelle la pièce de support 30 maintenue entre le premier boîtier et le deuxième boîtier peut être attachée et détachée dans le boîtier en effectuant un engagement ou un désengagement de la portion d'engagement. 35
12. Une cassette de ruban encreur selon la revendication 1, dans laquelle un chemin de déroulement d'un ruban encreur, qui est tiré une fois de la sortie de ruban formée sur le corps principal et passe jusqu'à un point relevé par la portion de ruban replié, et un 40 chemin de déroulement passant sur la surface de contact de la glissière à ruban au niveau de la portion de guidage du ruban, sont approximativement parallèles l'un à l'autre et leur directions de déroulement sont prévues dans un sens opposé l'une à 45 l'autre. 50
13. Une cassette de ruban encreur selon la revendication 1, dans laquelle la portion de corps principale comprend: 55
- une pièce support ayant une portion de guidage de ruban soutenant le noyau d'alimentation et le noyau d'enroulement; et

- une pièce boîtier capable de maintenir la pièce support en soutenant un premier boîtier et un deuxième boîtier, de façon à couvrir de l'extérieur le noyau d'alimentation et le noyau d'enroulement;
- dans laquelle, formée sur la pièce de support, il y a une première paroi latérale ayant une paire de portions de soutien circulaires et une deuxième paroi latérale ayant une paire de portions de soutien semi-circulaires;
- dans laquelle le deuxième boîtier de la pièce à boîtiers a, opposée à la deuxième paroi latérale, une troisième paroi latérale ayant une paire de portions de soutien semi-circulaires et, dans la portion opposée à la deuxième paroi latérale une quatrième paroi latérale ayant une paire de portions de soutien semi-circulaires ;
- dans laquelle les portions d'une extrémité du noyau d'alimentation et du noyau d'enroulement sont soutenues, de façon à pouvoir tourner, par les portions de soutien de la première paroi latérale et la troisième paroi latérale, et dans laquelle les autres portions du noyau d'alimentation et du noyau d'enroulement sont soutenues, de façon à pouvoir tourner, par les portions de soutien de la deuxième paroi latérale et la quatrième paroi latérale.
14. Une cassette de ruban encreur selon la revendication 13, dans laquelle le boîtier est formé d'une matière de résine et le premier boîtier et le deuxième boîtier sont unis par une charnière à paroi mince, le premier boîtier et le deuxième pouvant tourner par cette portion charnière.
15. Une cassette de ruban encreur selon la revendication 14, dans laquelle le boîtier a une portion d'engagement pouvant s'engager et se désengager en faisant tourner le premier boîtier et/ou le deuxième boîtier et dans lequel la pièce de soutien maintenue entre le premier boîtier et le deuxième boîtier peut être attachée et détachée dans la pièce boîtier en engageant et en désengageant la portion d'engagement.

FIG. 1

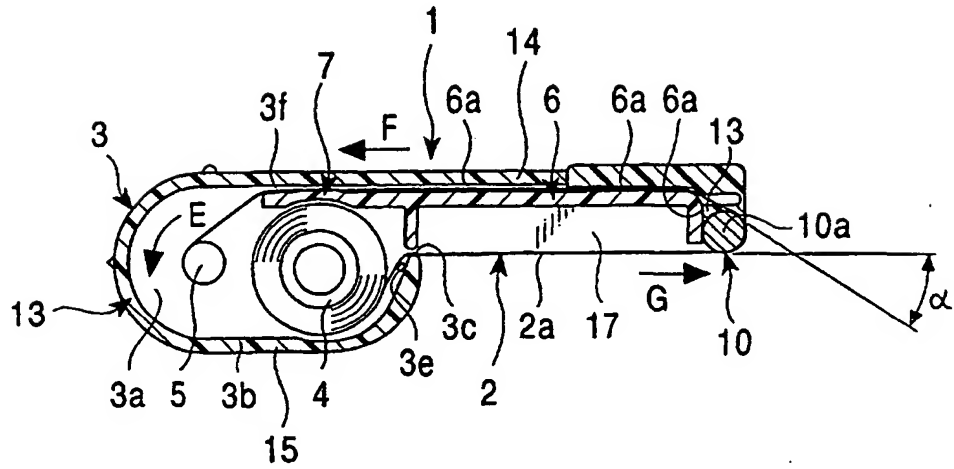


FIG. 2

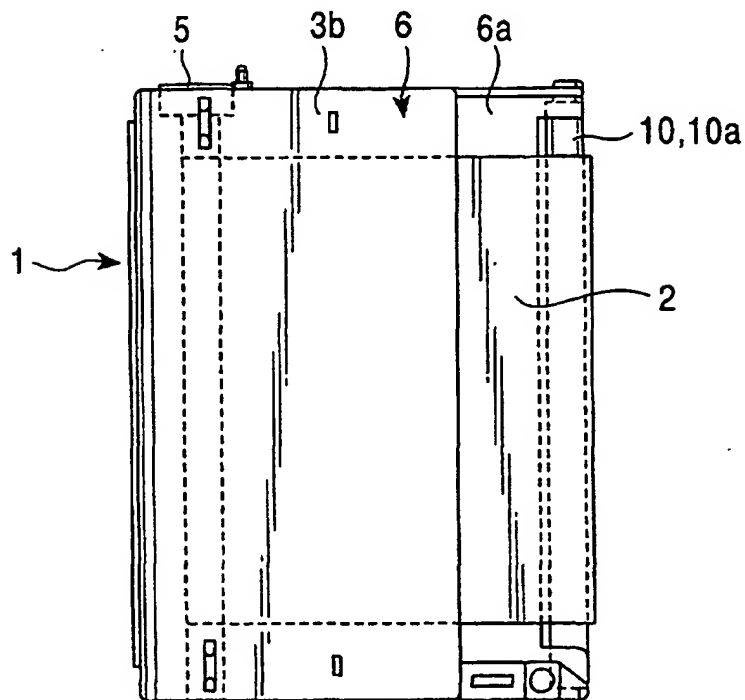


FIG. 3

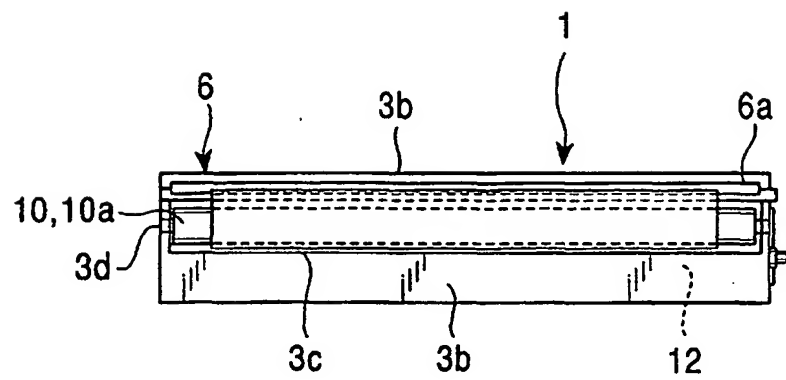


FIG. 4A

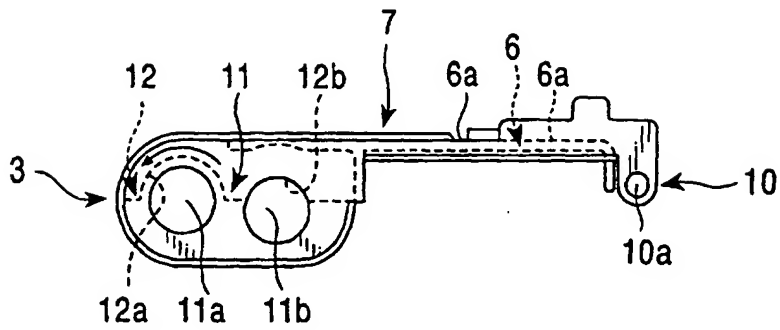


FIG. 4B

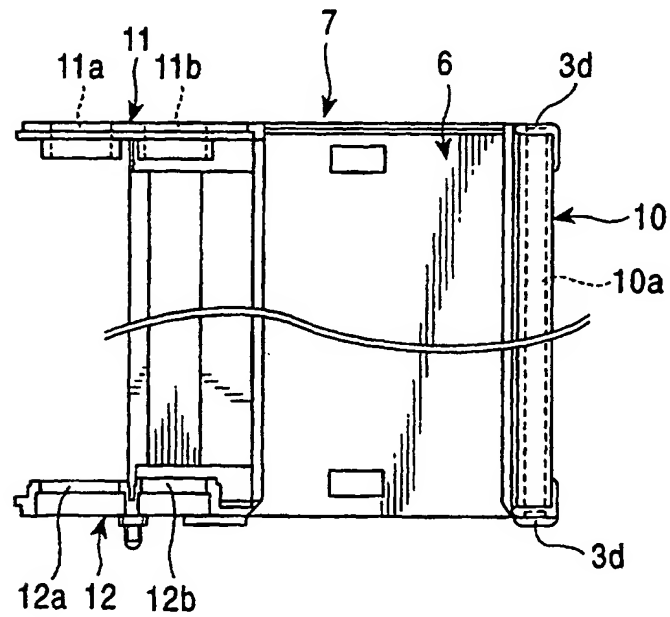


FIG. 4C

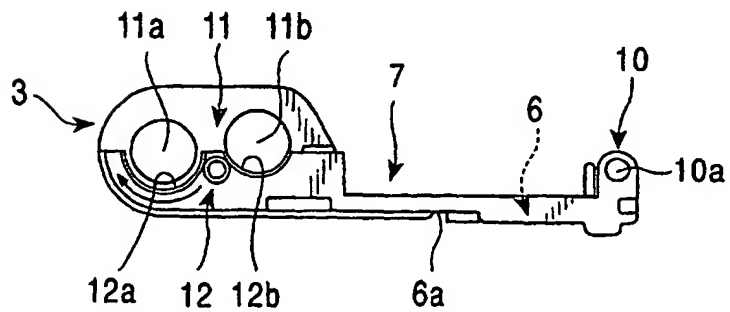


FIG. 5A

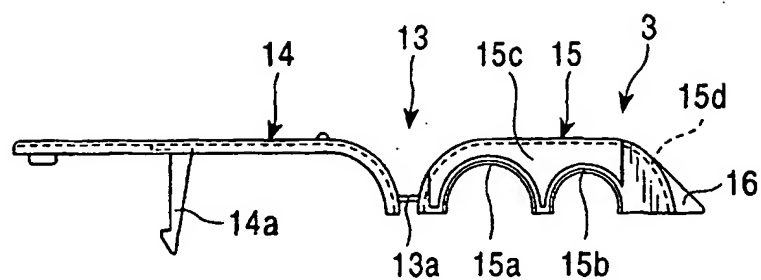


FIG. 5B

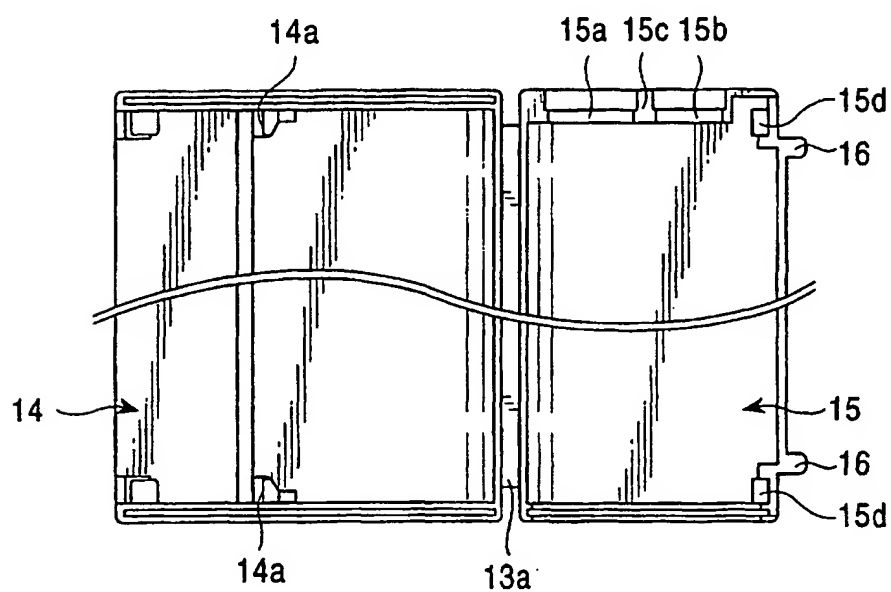


FIG. 5C

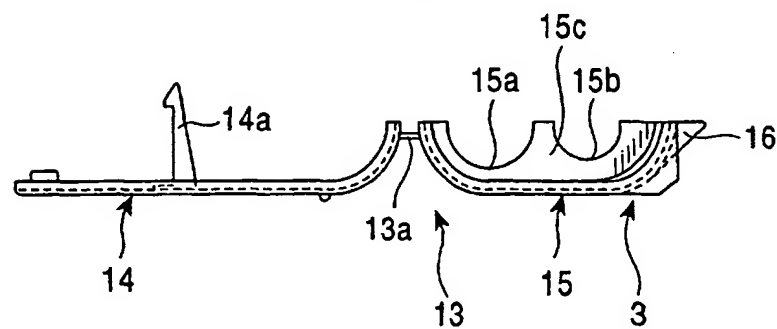


FIG. 6

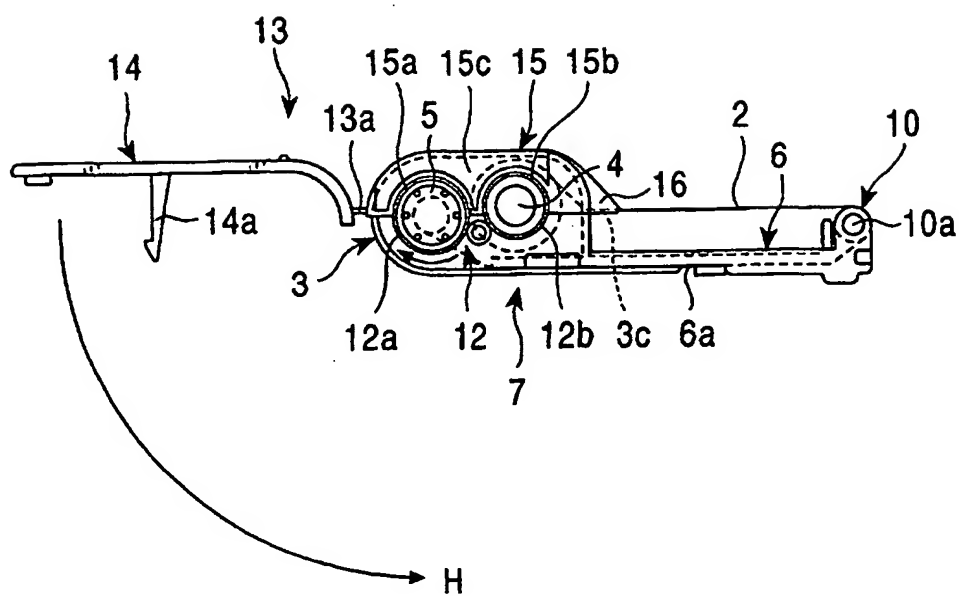


FIG. 7A

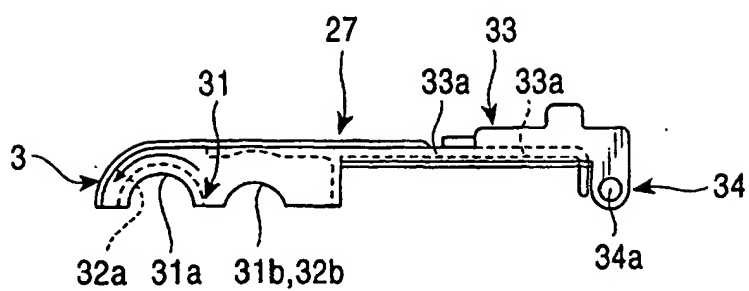


FIG. 7B

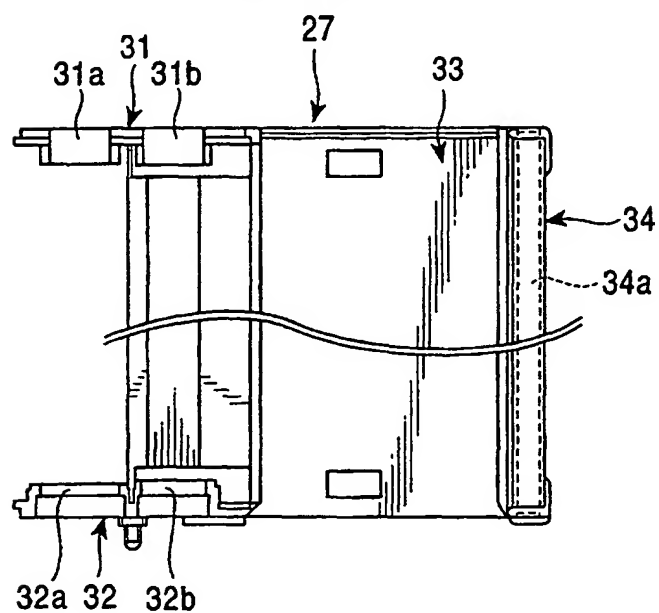


FIG. 7C

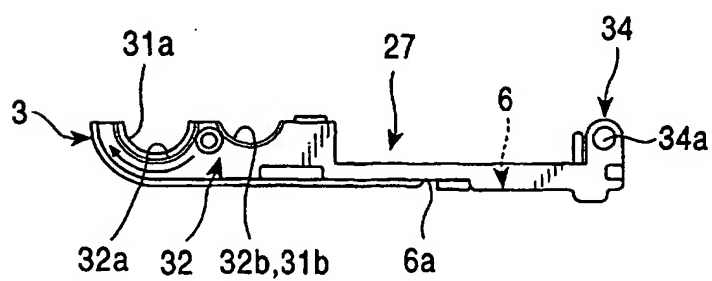


FIG. 8A

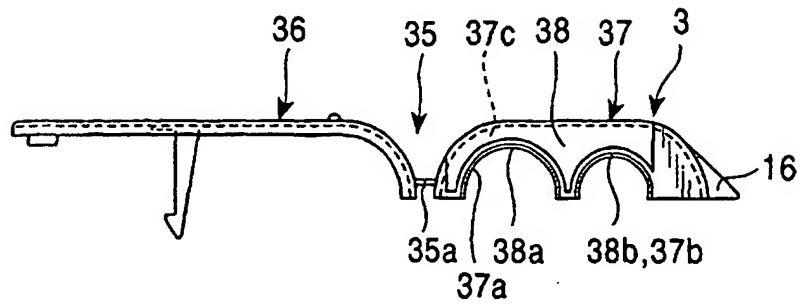


FIG. 8B

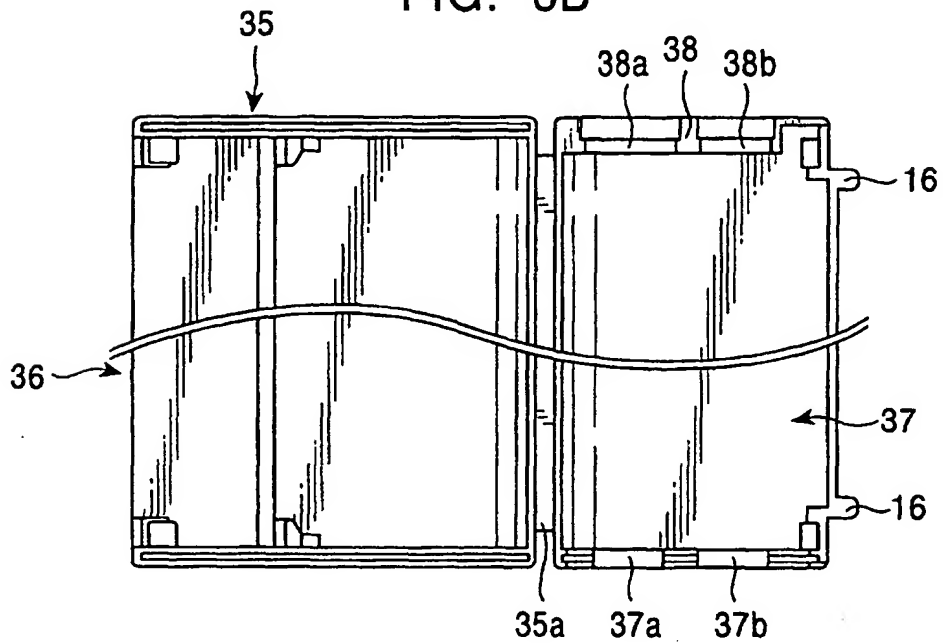


FIG. 8C

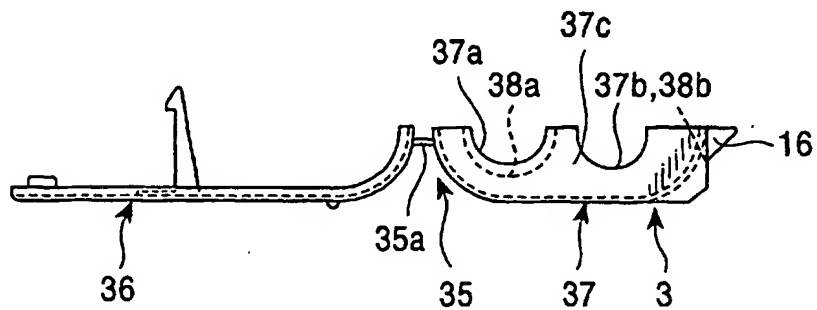


FIG. 9

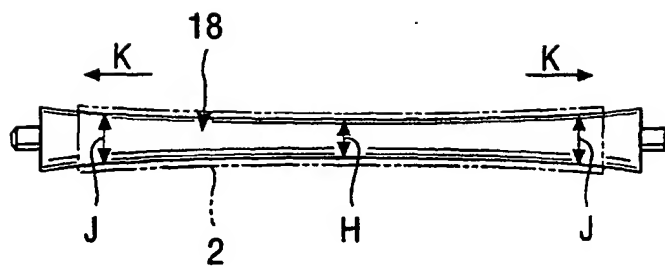


FIG. 10
PRIOR ART

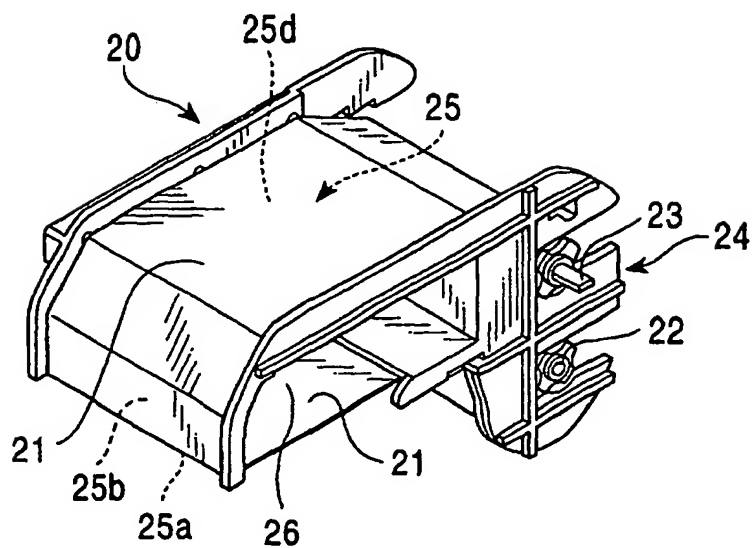


FIG. 11
PRIOR ART

